UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

September 18, 2003

Reply To
Attn Of: ECL-117

Kathleen E. Hain, Manager
Environmental Restoration Program
Department of Energy
Idaho Operations Office
850 Energy Drive
Idaho Falls, Idaho 83401-1563

Re: Five-Year Review for Pad A, Operable Unit 7-12, at the Idaho National Engineering and Environmental Laboratory (INEEL).

Dear Ms. Hain:

Enclosed is a copy of EPA's Five-Year Review for Pad A. EPA has determined that the remedy at Pad A currently protects human health and the environment because current data indicate that the cover is protective, ongoing maintenance and institutional controls preclude prolonged direct contact with the waste and current monitoring data indicate that the remedy is functioning as required to achieve cleanup goals. However, in order for the remedy to be protective in the long term, monitoring actions, to ensure that concentrations of contaminants in groundwater continue to decrease as anticipated, need to be taken.

EPA has the following recommendations for future actions at this site:

Consider impermeable alternatives to vegetation in limited vegetation-resistant areas and modify the O&M Plan as necessary.

Continue annual monitoring.

Include provisions for Pad A institutional controls consistent with Region 10 guidance in OU 7-13/14 decision documents and OU 10-04 sitewide IC plan.

The next five-year review for Pad A is required by September 2008, five years from the date of this review. This requirement may be met by the inclusion of Pad A in the next INEEL sitewide five-year review (2005).

If you have any questions, please contact me at 206-553-8633.

Sincerely,

Richard Poeton
Office of Environmental Cleanup

enclosure

cc: Dean Nygard, IDEQ, 1410 N. Hilton, Boise, ID 83706
Wayne Pierre, ECL-113
D. Koch, IDEQ, 1410 N. Hilton, Boise, ID 83706
Mark Shaw, DOE-ID

Five-Year Review Report

Five-Year Review Report
for
OU 7-12 (Pad A)
Idaho National Engineering and Environmental Laboratory

September 2003

PREPARED BY:

United States Environmental Protection Agency
Region 10
Seattle, Washington

Approved by:

Date: 18 Sept. 2003

Michael F. Gearheard, Director
Office of Environmental Cleanup
U.S. EPA, Region 10

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List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
BLM	Bureau of Land Management
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
DOE	Department of Energy
EPA	United States Environmental Protection Agency
FFA/CO	Federal Facility Agreement/Compliance Order
IDAPA	Idaho Administrative Procedure Act
IDEQ	Idaho Department of Environmental Quality
INEEL	Idaho National Engineering and Environmental Laboratory
MCL	Maximum Contaminant Level
NCP	National Contingency Plan
NPL	National Priorities List
NRTS	National Reactor Testing Station
O&M	Operation and Maintenance
PSD	Performing Settling Defendant
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project manager
RWMC	Radioactive Waste Management Complex
SDA	Subsurface Disposal Area
TBC	To Be Considered
TRU	Transuranic waste

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Executive Summary

The remedy for OU 7-12 (Pad A) at the Idaho National Engineering and Environmental Laboratory Superfund site included site recontouring, maintenance of the cover, monitoring, and institutional controls. The trigger for this five-year review was the two-year review completed on December 17, 1997.

The assessment of this five-year review found that the remedy was constructed in accordance with the requirements of the Record of Decision (ROD). The remedy is functioning as designed. The immediate threats have been addressed and the remedy continues to be protective.

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Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: INEEL OU 7-12 (Pad A)		
EPA ID *(from WasteLAN)*: ID4890008952		
Region: 10	**State:** ID	**City/County:** Idaho Falls/Butte Co.
SITE STATUS		
NPL status: ☒ Final ☐ Deleted ☐ Other (specify)		
Remediation status (choose all that apply): ☐ Under Construction ☐ Operating ☒ Complete		
Multiple OUs?* ☐ YES ☒ NO	**Construction completion date:** N/A	
Has site been put into reuse? ☐ YES ☒ NO		
REVIEW STATUS		
Lead agency: ☐ EPA ☐ State ☐ Tribe ☒ Other Federal Agency		
Author name: Richard Poeton		
Author title: Remedial Project Manager	**Author affiliation:** U.S. EPA, Region 10	
Review period:** 6/1/2003 to 9/30/2003		
Date(s) of site inspection: 9/16/2002		
Type of review: ☒ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only ☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ☐ Regional Discretion)		
Review number: ☐ 1 (first) ☒ 2 (second) ☐ 3 (third) ☐ Other (specify)		
Triggering action: ☐ Actual RA On-site Construction at OU #__ ☐ Actual RA Start at OU# NA ☐ Construction Completion ☐ Previous Five-Year Review Report ☒ Other (specify) Previous Two-Year Review Report		
Triggering action date *(from WasteLAN)*: 12/17/1997		
Due date *(five years after triggering action date)*: 9/30/2003		

* ["OU" refers to operable unit.]
** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd.

Issues:

Revegetation of the cap has not been complete in spite of repeated annual seeding and planting efforts.

COCs continue to be detected at low levels in lysimeter and well water samples.

Recommendations and Follow-up Actions:

Consider impermeable alternatives to vegetation in limited vegetation-resistant areas. Modify the O&M Plan as necessary.

Continue annual monitoring.

Protectiveness Statement(s):

The remedy at Pad A currently protects human health and the environment because current data indicate that the cover is protective, ongoing maintenance and institutional controls preclude prolonged direct contact with the waste and current monitoring data indicate that the remedy is functioning as required to achieve cleanup goals. However, for the remedy to be protective in the long term monitoring actions, to ensure that concentrations of contaminants in groundwater continue to decrease as anticipated, are needed to ensure long-term protectiveness.

All immediate threats at the site have been addressed, and the remedy continues to be protective of human health and the environment..

Other Comments:

This OU is part of the larger OU 7-13/14 and as such will also need to be addressed in the context of the overall OU 7-13/14 RI/FS and remedy. The draft Remedial Investigation/Baseline Risk Assessment for OU 7-13/14 is scheduled for August 2005, and the draft Feasibility Study is scheduled for December 2005.

Pad A (OU 7-12)
Idaho National Engineering and Environmental Laboratory
Five-Year Review Report

I. Introduction

The purpose of the five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and identify recommendations to address them.

The Agency is preparing this Five-Year Review report pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgement of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

The Agency interpreted this requirement further in the NCP; 40 CFR §300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

The United States Environmental Protection Agency (EPA), Region 10, conducted the five-year review of the remedy implemented at OU 7-12 (Pad A) at the Idaho National Engineering and Environmental Laboratory (INEEL). This review was conducted by the Remedial Project Manager (RPM) for the site and this report documents the results of the review.

This is the second review for this site. Pursuant to the provisions of the 1994 Record of Decision (ROD) for Pad A, a Two-Year Review was performed and completed on December 17, 1997. The Two-Year Review is the triggering action for this statutory review. The five-year review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the site above levels that allow for unlimited use and unrestricted exposure.

II. Site Chronology

Table 1 - Chronology of Site Events

Event	Date
Construction of Pad A and disposal of wastes.	1972 - 1978
Environmental monitoring and investigations.	1978 - 1989
Final listing of INEEL on EPA National Priorities List	11/21/1989
INEEL FFA/CO	12/9/1991
Public Scoping meetings for Pad A.	12/1991
Pad A Remedial Investigation/Feasibility Study (RI/FS) made available to public	1/1992
Pad A Proposed plan identifying preferred remedy presented to public; start of public comment period.	7/1993
ROD selecting the Limited Action remedy is signed.	1/27/94
Short Term Monitoring Plan approved	6/1994
Long Term Monitoring Plan approved.	8/1995
Completion of Two Year Review.	12/17/97
Revision of Operations, Maintenance, and Monitoring Plan	1/2001
Post-ROD Monitoring	1994-2003

III. Background

Physical Characteristics

The Idaho National Engineering and Environmental Laboratory (INEEL) is a government facility managed by the U.S. Department of Energy (DOE) located 32 miles west of Idaho Falls, Idaho, and occupying 890 square miles of the northeastern portion of the Eastern Snake River Plain. The Radioactive Waste Management Complex (RWMC) is located in the southwestern portion of INEEL. Pad A is located in the north-central portion of the Subsurface Disposal Area (SDA) within the RWMC, and is approximately 240 x 335 feet.

The INEEL is located on the northeastern edge of the Eastern Snake River Plain, a volcanic plateau, that is primarily composed of silicic and basaltic rocks and relatively minor amounts of sediment. Underlying the RWMC are a series of basaltic lava flows with sedimentary interbeds. The depth to the Snake River Plain Aquifer underlying the INEEL varies from 200 ft. in the northern portion to 900 ft. in the southern portion of INEEL. The depth to the aquifer at the RWMC is approximately 580 ft. Regional groundwater flow is generally to the southwest. The INEEL has semidesert characteristics with hot summers and cold winters. The only surface water present is the Big Lost River, approximately 1.5 miles northwest of the RWMC, but due to the arid nature of the area, this river typically is dry.

Land and Resource Use

INEEL was established in 1949 as the National Reactor Testing Station (NRTS). The RWMC was established in the early 1950's as a disposal site for solid, low-level waste produced by INEEL operations. Within the RWMC is the SDA where hazardous substances (radioactive and hazardous wastes) have been disposed in underground pits, trenches, soil vault rows, and Pad A - an aboveground pad.

Irrigated farmlands exist adjacent to approximately 25% of the INEEL boundary. Crops grown on these lands include alfalfa, wheat, and potatoes. Lands acquired for the NRTS were originally under control of the BLM and were withdrawn through public land orders, prior to which the land was used primarily as rangeland. Approximately 300,000 acres around the perimeter of the INEEL have been open to grazing through permits administered by the BLM. Since 1957, approximately 535 square miles in the central portion of INEEL have been maintained as a grazing exclusion area. Other areas of the site have been used as bombing and gunnery ranges, and some have been cleared for large DOE projects. The BLM has classified the acreage within the INEEL as industrial and mixed use. It is used as a nuclear research, materials, and development facility.

History of Contamination

Pad A is an aboveground earthen-covered disposal site for containerized waste contaminated to less than 10 nCi/g of transuranic (TRU) radionuclides and exhibiting dose rates of less than 200 mR/hr at the surface of each container. Approximately 13,300 cubic yards of containerized solid wastes were placed on a 240 x 335 ft. asphalt pad (Pad A) between 1972 and 1978. The asphalt pad is approximately 2 to 3 inches thick. All but two shipments of waste disposed of on Pad A contain less than 100 nCi/g of TRU. The other two shipments contained waste with TRU concentrations exceeding 100 nCi/g. No waste

disposal has occurred on Pad A since its closure in 1978.

Pad A wastes are composed primarily of nitrate salts, depleted uranium waste, and sewer sludge, including: evaporator salts from the Rocky Flats Plant contaminated with transuranic radionuclides, oxides of uranium, uranium casting wastes, beryllium foundry wastes, and machining wastes from the Rocky Flats Plant, dry sewage from Rocky Flats contaminated with low levels of transuranic radionuclides, and miscellaneous INEEL-generated radioactive wastes such as lab wastes.

Initial Response

Pad A operational closure was performed in 1978 by placing plywood and/or polyethylene over the exposed containers. The waste pile was then covered with a soil layer 3 feet to 6 feet in thickness, and seeded with crested wheatgrass to minimize soil erosion. Since Pad A closure, environmental monitoring has been performed at the site to detect contaminant migration and has included monitoring of surface water, groundwater, soil, and biota. In addition, other investigations were conducted prior to the initiation of FFA/CO activities. These included an investigation in 1979 to determine the condition of the buried drums and plywood boxes. Another investigation in 1989 included determination of radiological contamination of the external surfaces of the drums. Results of laboratory analyses did not indicate that radioactive contamination was present on or near the drums. The investigation also involved surveying for volatile organic compounds (VOCs) and sampling for beryllium and nitrates to determine whether significant contaminant migration or failure of the cover had occurred.

Pad A was identified for a Remedial Investigation/Feasibility Study (RI/FS) under the INEEL FFA/CO. The ROD for Pad A was completed on January 27, 1994.

Basis for Taking Action

Contaminants

Environmental monitoring of ground water, surface water, air, and soil during the RI did not demonstrate any contaminant releases attributable to Pad A wastes. Therefore, fate and transport modeling of Pad A wastes was used in the Baseline Risk Assessment to evaluate potential risks. Contaminants evaluated in the Baseline Risk Assessment are the following radionuclides and inorganic compounds identified in the waste inventory.

Radionuclides	Inorganic Compounds
Potassium	Sodium Nitrate
Thorium	Potassium Nitrate
Uranium	Sodium Chloride
Plutonium	Potassium Chloride
Americium	Sodium Sulfate
	Potassium Sulfate
	Sodium Hydroxide
	Potassium Hydroxide
	Triuranium Octaoxide

The ROD determined that threatened releases of, and prolonged contact with, hazardous substances from the site, if not addressed by implementing response actions, may present a potential threat to public health, welfare, or the environment at the boundary of Pad A.

IV. Remedial Actions

Remedy Selection

The ROD for Pad A was signed on January 27, 1994. Remedial Action Objectives (RAOs) were developed during the Remedial Investigation to aid in the development and screening of remedial alternatives to be considered for the ROD. The results of the investigation and risk assessment indicated that the existing Pad A cover was protective for the Pad A contents. However, prolonged direct contact with the Pad A waste would likely pose an unacceptable risk. Consequently, the focus of the RAOs was on maintaining the effectiveness of the existing cover to prevent direct exposure to the wastes and to minimize the potential for contaminant migration from the pad to surface water or ground water.

Remedy Implementation

In accordance with the INEEL FFA/CO, the Remedial Design/Remedial Action Scope of Work was completed on May 9, 1994, and the Remedial Design/Remedial Action Work Plan was completed in June of 1994. The major components of the Limited Action remedy included:

- Recontouring and slope correction;
- Institutional controls; and
- Maintaining and monitoring the existing Pad A cover.

The Remedial Action (RA) took place in two phases. The first phase consisted of the recontouring of the Pad A slopes. The activities for this phase were performed between August and November, 1994.

The second phase consisted of the installation of environmental monitoring equipment. This involved the drilling of boreholes and was performed between April and July, 1995. The Remedial Design/Remedial Action Workplan specified that EPA and IDEQ would perform independent reviews of

the maintenance and monitoring data within two years to ensure that the remedy continues to provide adequate protection of human health and the environment. The pre-final inspection for the first phase recontouring activities was performed on December 9, 1994. Outstanding items from the prefinal inspection were resolved and documented in the RA Report. EPA and the State determined that all RA construction activities, including the implementation of institutional controls, and monitoring, were performed according to specifications.

System Operation/Operation and Maintenance

DOE is conducting long-term monitoring and maintenance activities according to the operation and maintenance (O&M) plan that was approved by EPA and the Idaho Department of Environmental Quality (IDEQ) on September 8, 1998. The primary activities associated with O&M include the following:

- Inspection and corrective maintenance of the vegetative cover.
- Inspection and corrective maintenance of the soil cover.
- Inspection and corrective maintenance of the rock armoring.
- Annual monitoring of lysimeter and monitoring wells.
- Monitoring of vegetative cover, soil cover, and rock armor.
- Inspection of institutional controls.

The primary action on the site took place during the construction phase of the Remedial Action (*i.e.* the recontouring of the cover). The remaining components of cleanup include institutional controls, inspection, and maintenance. Therefore, as indicated in the planned elements above, the primary O&M activities have been geared towards monitoring, and maintenance of the cap.

An ongoing issue exists concerning the relationship between this remedial action and the larger upcoming actions to be taken for the SDA and RWMC as a whole. Pad A is a small component of the larger SDA and RWMC and it is recognized that Pad A may need to be modified to fit into the overall remedy for those areas. The contaminants in Pad A are being assessed as part of the overall OU 7-13/14 RI/FS evaluation of the SDA. Based on the outcome of the OU 7-13/14 RI/FS, modifications to the Pad A decision may be necessary to ensure optimal and consistent remedies for the site as a whole. The OU 7-13/14 schedule includes submittal of the draft RI/FS to EPA and IDEQ by December 2005 and the submittal of the draft ROD by December 2006

The present-dollar cost for the Limited Action of Pad A was estimated in the 1994 ROD at $2,196,500, including maintenance and 30 years of monitoring. The cost for Remedial Design activities was estimated at $294,000. Remedial Action costs documented in the RA Report totaled $1,031,970, including Remedial Action ($971,987), Environmental Monitoring ($24,084), and Documentation ($35,899). O&M costs include cap structure maintenance, sampling and monitoring efforts, and monitoring well maintenance. Annual O&M costs since the last review, as reported verbally by DOE, are

included in Table 2.

Table 2 - Annual O&M Costs

Dates		Total Cost rounded to nearest $1,000
From	To	
9/1996	9/1997	$71,000
9/1997	9/1998	$26,000
9/1998	9/1999	$60,000
9/199	9/2000	$8,000
9/2000	9/2001	$68,000
9/2001	9/2002	$61,000
9/2002	5/2003	$12,000

V. Progress Since the Last Five-Year Review

This is the second review for this site. Since the previous review, requirements for operations and maintenance have been established and inspection, sampling and monitoring have been performed, documented and reported.

VI. Five-Year Review Process

Administrative Components

The Pad A Five-Year Review was performed by Richard Poeton of EPA, Remedial Project Manager (RPM) for the site. The review consisted of a review of the monitoring and other data associated with the performance of the remedial action. This small site is of minor concern to the public compared to the large issues associated with the INEEL SDA and RWMC as a whole, and there is minimal community interest in the site. Therefore there were no community interviews conducted. The Department of Energy will issue a press release to announce the completion and availability of this review.

DOE performs monthly site inspections. On an annual basis, a detailed independent inspection is performed and provided to EPA and IDEQ.

Document Review

This five-year review consisted of a review of relevant documents including O&M records and monitoring data.

Data Review

Vegetative Cover:

In accordance with the Operations, Maintenance, and Monitoring Plan for OU 7-12, Rev. 2 (EM-ER-07-019), vegetation on Pad A is monitored on a monthly basis (except when snow-covered), with qualitative information incorporated into the DOE Environmental Restoration (ER) WAG 7 Pad A files. In addition, an independent annual inspection is performed in late summer. The most recent annual inspection was performed on September 16, 2002 by IDEQ, accompanied by DOE contractor personnel. This inspection found that Pad A continues to have no growth on its top and north-northeast side. Previous revegetation efforts have not significantly improved vegetative cover. It is possible that exposure, wind erosion and dessication of seedlings all contribute to this condition. Limited growth on the north-northwest side may also be due to snow accumulation preventing early spring warmup in that area. These areas have consistently been unable to sustain planted crested wheatgrass. Routine inspection since September of 2002, and the reseeding effort of the fall of 2002, continuing up to the summer of 2003, confirm these observations. Reseeding efforts at Pad A have been ongoing for more than eight years in an effort to establish an evapotranspirative mechanism to limit moisture infiltration into the cover. Subsequent site visits by EPA and IDEQ to the Subsurface Disposal Area, of which Pad A is a part, have occurred most recently on August 13, 2003.

Soil Cover and Rock Armor:

The condition of the soil cover is monitored as part of the monthly O&M inspections, with particular emphasis on areas of subsidence. Small areas of subsidence have been noted, monitored, and repaired on an ongoing basis.

Institutional Controls:

Institutional controls are monitored as part of the monthly O&M inspections, and also as part of the annual inspection. As specified in the O&M Plan, institutional controls will consist of engineering and administrative controls to protect current and future users. Engineering controls may include access controls (e.g. markers, fencing, enclosures and/or locking devices), and visible access restrictions. The Pad A signs will clearly identify the site and point of contact (including the phone number) for the site. Administrative controls may include controls of activities through procedures and work control measures during DOE operations at the site, and recording the location and coordinates of the site. Based on the annual reports and inspections, all required institutional controls remain in place and effective.

The ROD for this OU predates the EPA Region 10 "Final Policy on the Use of Institutional Controls at Federal Facilities" (May 3, 1999) , and consequently the ROD does not incorporate specific details regarding institutional control elements of selected remedies. These details, as described by the Region 10 policy, include the geographical locations where institutional controls are required, the specific objectives of the controls, and the types of controls. The ROD does not describe how these controls will be implemented, maintained and monitored, both while DOE has control of the property as well as if and when the property is transferred to other federal ownership or private ownership. The Region 10 guidance also specifies the need for a comprehensive facility-wide approach to establishing, implementing, enforcing, and monitoring institutional controls, and ROD does not address this issue. Upcoming decisions and actions under OU 7-13/14 and OU 10-04 will address institutional controls for

the Subsurface Disposal Area, of which Pad A is a part, and for the INEEL sitewide. The next five year review should verify that provisions in place for Pad A institutional controls are consistent with Region 10 guidance.

Lysimeter and Well Sampling:

For WAG 7 as a whole, sixty lysimeters and perched water wells are sampled on an annual basis, and analyzed for radionuclides, nitrate, metals, and volatile organic compounds (sample volume permitting). In the most recent sampling event (October 2002), 32 of the 60 locations yielded sufficient water to perform radionuclide analyses, and one of those 32 yielded sufficient volume for nitrate analyses. Sample volumes were not sufficient for analysis of metals or volatile organic compounds. Of the 32 samples analyzed for radionuclides, 25 had positive radionuclide detections. Radionuclides detected were H-3, Cl-36, Tc-99, Ra-226, U-233/234, U-235/236, and U-238. Of these, Cl-36, Tc-99 and isotopic uranium were detected at levels exceeding background. All Cl-36 and Tc-99 detections were below drinking water risk-based concentrations of 1E-5. For the uranium, seven results exceeded risk-based concentrations of 1E-5.

The Pad A O&M plan requires sampling of Pad A lysimeter vadose zone wells PA-01, PA-02, PA-03, D-06 and TW-1 on an annual basis with nitrate analysis as a priority. These vadose zone wells are located near the perimeter of the Pad A footprint. In addition, USGS Well #92 will be monitored for nitrates. In the October 2002 sampling, the USGS-92 well results exceeded background levels for nitrates, but were below the drinking water MCL. Since the 1997 review, isotopic uranium analyses have been performed on samples from the PAD A lysimeters. Detections have been observed in these analyses that range from levels below risk-based concentrations to levels exceeding drinking water standards. One lysimeter location (D06-DL01) demonstrated an apparent increasing uranium trend through 2000, but subsequent samples have not been obtainable. With this exception, historical analysis of these results does not show any obvious trends. see Figures 1-4 and Attachments 3 and 4 for uranium and nitrate sampling data.

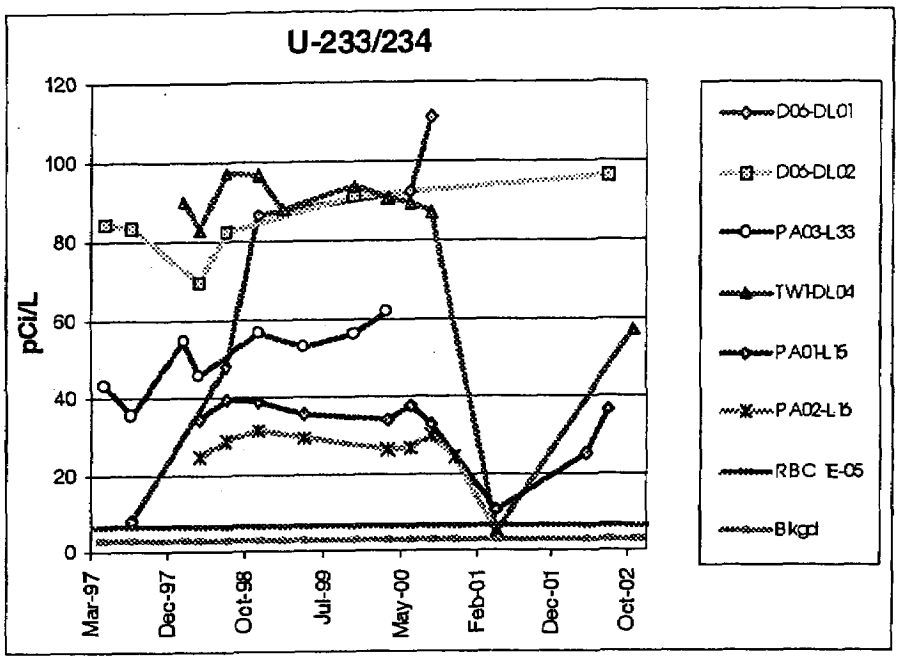

Figure 1: Isotopic U-233/U-234 uranium concentrations of soil moisture samples (lysimeters) collected around the RWMC Pad A area.

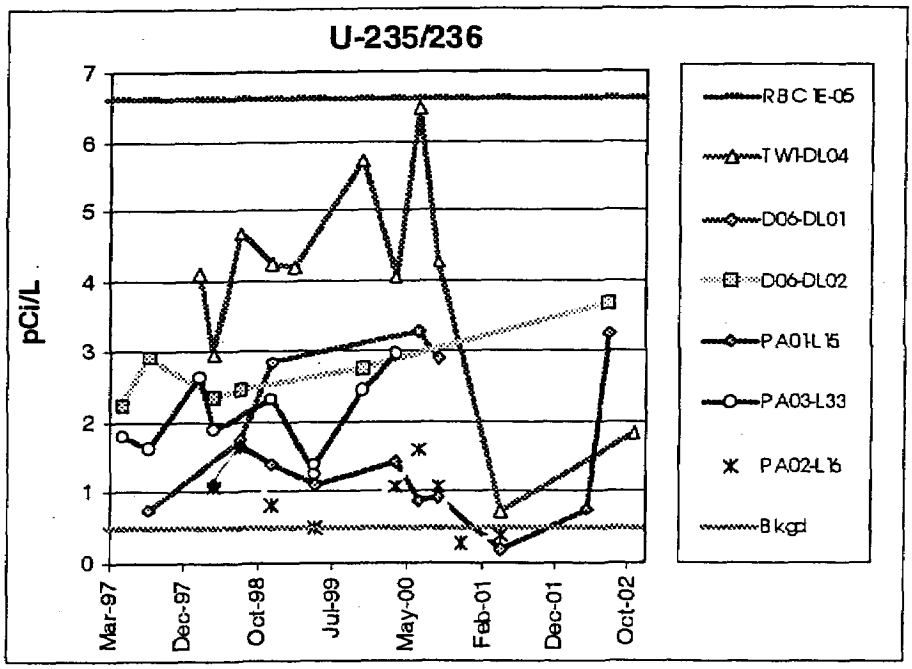

Figure 2: Isotopic U-235/U-236 uranium concentrations of soil moisture samples (lysimeters) collected around the RWMC Pad A area.

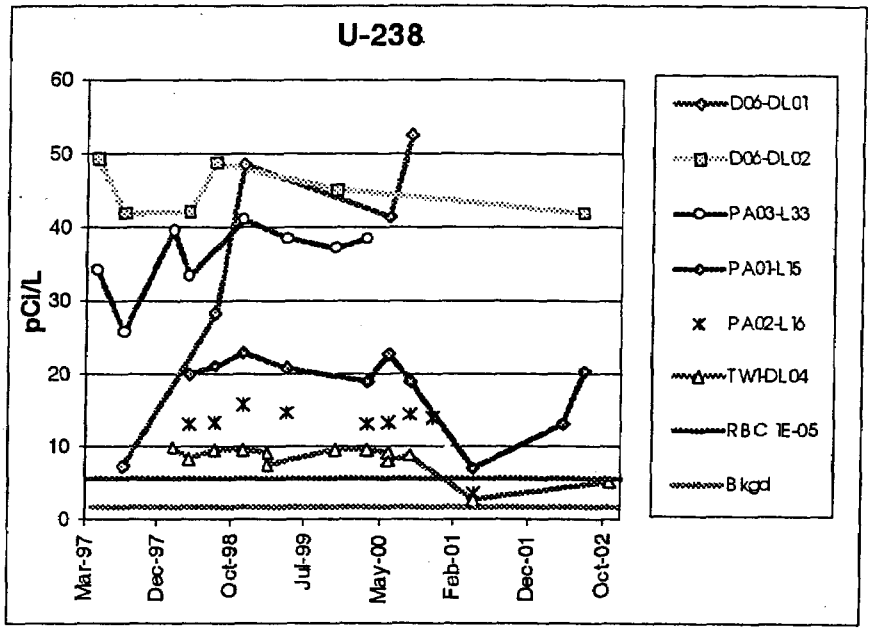

Figure 3: Isotopic U-238 uranium concentrations of soil moisture samples (lysimeters) collected around the RWMC Pad A area.

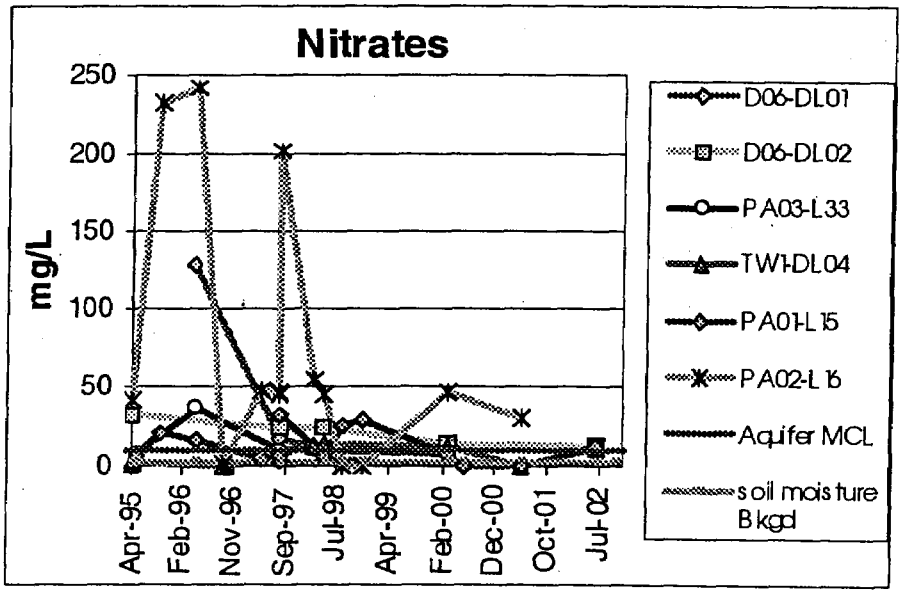

Figure 4: Nitrate concentrations for Pad A lysimeters.

Site Inspection

A site inspection was performed on September 16, 2002 by IDEQ, accompanied by DOE contractor personnel. The purpose of the inspections was to assess the protectiveness of the remedy, including the presence of fencing to restrict access, the integrity of the cap in accordance with the O&M Plan. No significant issues have been identified at any time regarding the cap. Examination of the cap confirmed the ongoing issues with establishing a vegetative cover on the top and the north-northeast side. No activities were observed that would have violated the institutional controls. The cap and the surrounding area were undisturbed. Subsequent site visits by EPA and IDEQ to the Subsurface Disposal Area, of which Pad A is a part, have occurred most recently on August 13, 2003.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, ARARs, risk assumptions, and the results of the site inspection indicates that the remedy is functioning as intended by the ROD. The recontouring and monitoring have achieved the remedial objectives to maintain the effectiveness of the existing cover to prevent direct exposure to wastes and to minimize the potential for contaminant migration from the pad to surface water or groundwater.

Operation and maintenance of the cap has, on the whole, been effective. Some areas have resisted revegetation despite repeated efforts. Some limited subsidence has been identified and corrected. O&M annual costs are consistent with original estimates and there are no indications of significant difficulties with the remedy.

There were no opportunities for system optimization observed during this review. The monitoring well network provides sufficient data to assess potential releases, and maintenance on the cap is sufficient to maintain it's integrity.

The institutional controls required are in place are effective. No activities were observed that would have violated the institutional controls. The cap and the surrounding area were undisturbed, The fence around the site is intact and in good repair.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy.

Changes in Standards and To Be Considered

There have been no changes in ARARs and no new standards or TBCs affecting the protectiveness of the remedy.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

The results of the remedial investigation and risk assessment indicated that the existing Pad A cover is a protective barrier for the Pad A contents. Although not quantified, prolonged direct contact with Pad A would be likely to pose an unacceptable risk, however, There have been no changes to exposure assumptions or in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment. These assumptions are considered to be conservative and reasonable in evaluating the site risks. No change to these assumptions, or to the decisions on which they were based, is warranted. There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

Lysimeter and well samples continue to show uranium and nitrate concentrations at low levels with no clear trend since the last review. No weather-related events have affected the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

Technical Assessment Summary

According to the data reviewed and the site inspection, the remedy is functioning as intended by the ROD. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. ARARs cited in the ROD have been met. There has been no changes in the toxicity factors for the contaminants of concern that were used in the baseline risk assessment, and there have been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

VIII. Issues

Table 3 - Issues

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Lack of success in efforts to revegetate some portions of the cap.	N	N
Continued detections of COCs in lysimeter and well sampling.	N	N

IX. Recommendations and Follow-Up Actions

Table 4 - Recommendations and Follow-Up Actions

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
Incomplete revegetation of cap	Consider impermeable alternatives. Modify O&M Plan as needed.	DOE	State/EPA	9/30/2008 Next 5-year review.	N	N
Continued detections of COCs in lysimeter and well data	Continued monitoring.	DOE	State/EPA	9/30/2008 Next 5-year review.	N	N
ROD lacks specifics for institutional controls	Include provisions for Pad A in OU 7-13/14 decision documents and OU 10-04 sitewide IC plan as appropriate.	DOE	State/EPA	9/30/2008 Next 5-year review.	N	N

X. Protectiveness Statement

The remedy at Pad A currently protects human health and the environment because current data indicate that the cover is protective, ongoing maintenance and institutional controls preclude prolonged direct contact with the waste and current monitoring data indicate that the remedy is functioning as required to achieve cleanup goals. However, in order for the remedy to be protective in the long term, monitoring actions, to ensure that concentrations of contaminants in groundwater continue to decrease as anticipated, need to be taken.

XI. Next Review

The next five-year review for Pad A is required by September 2008, five years from the date of this review. This requirement may be met by the inclusion of Pad A in the next INEEL sitewide five-year review (2005).

ATTACHMENTS

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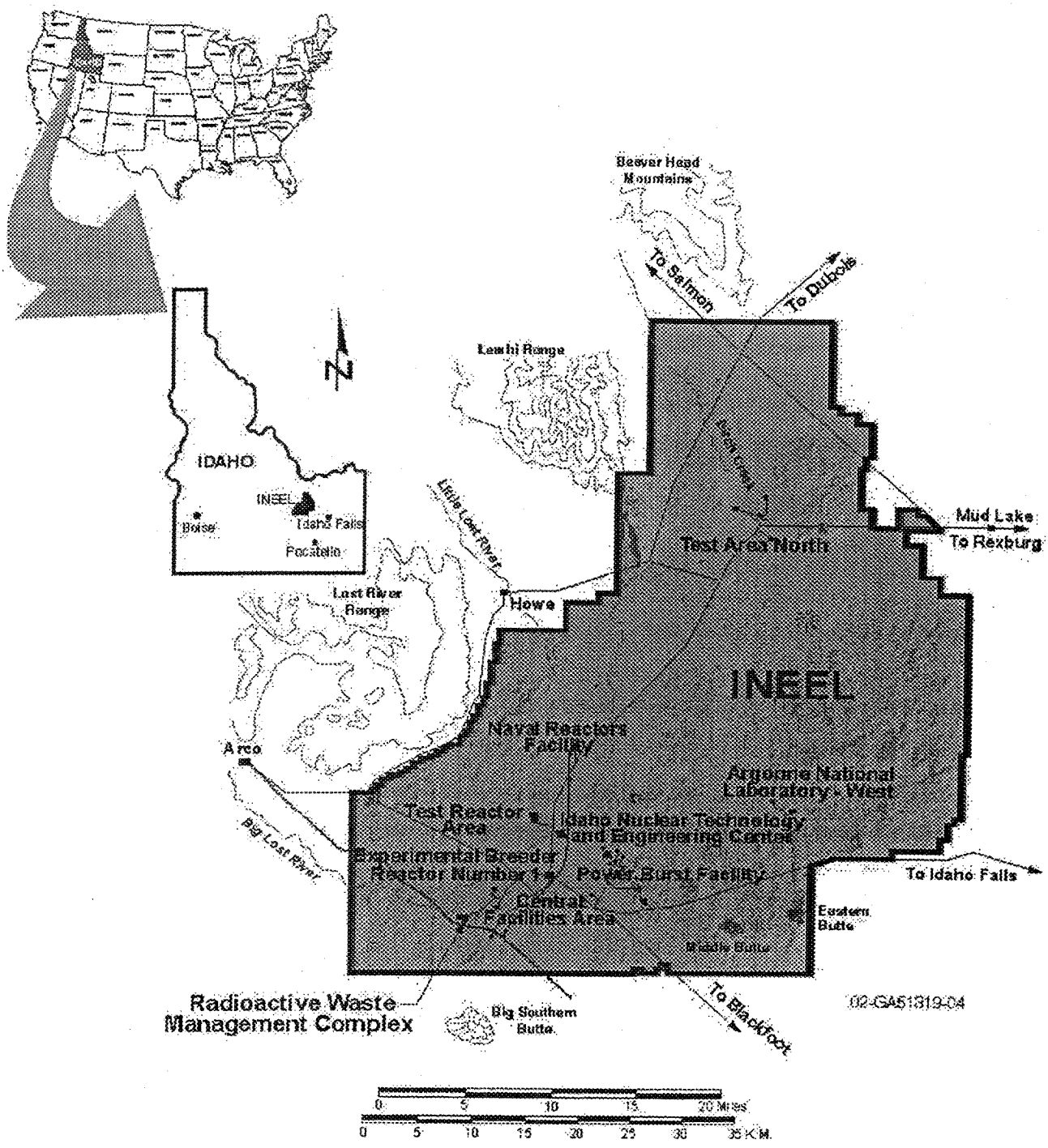
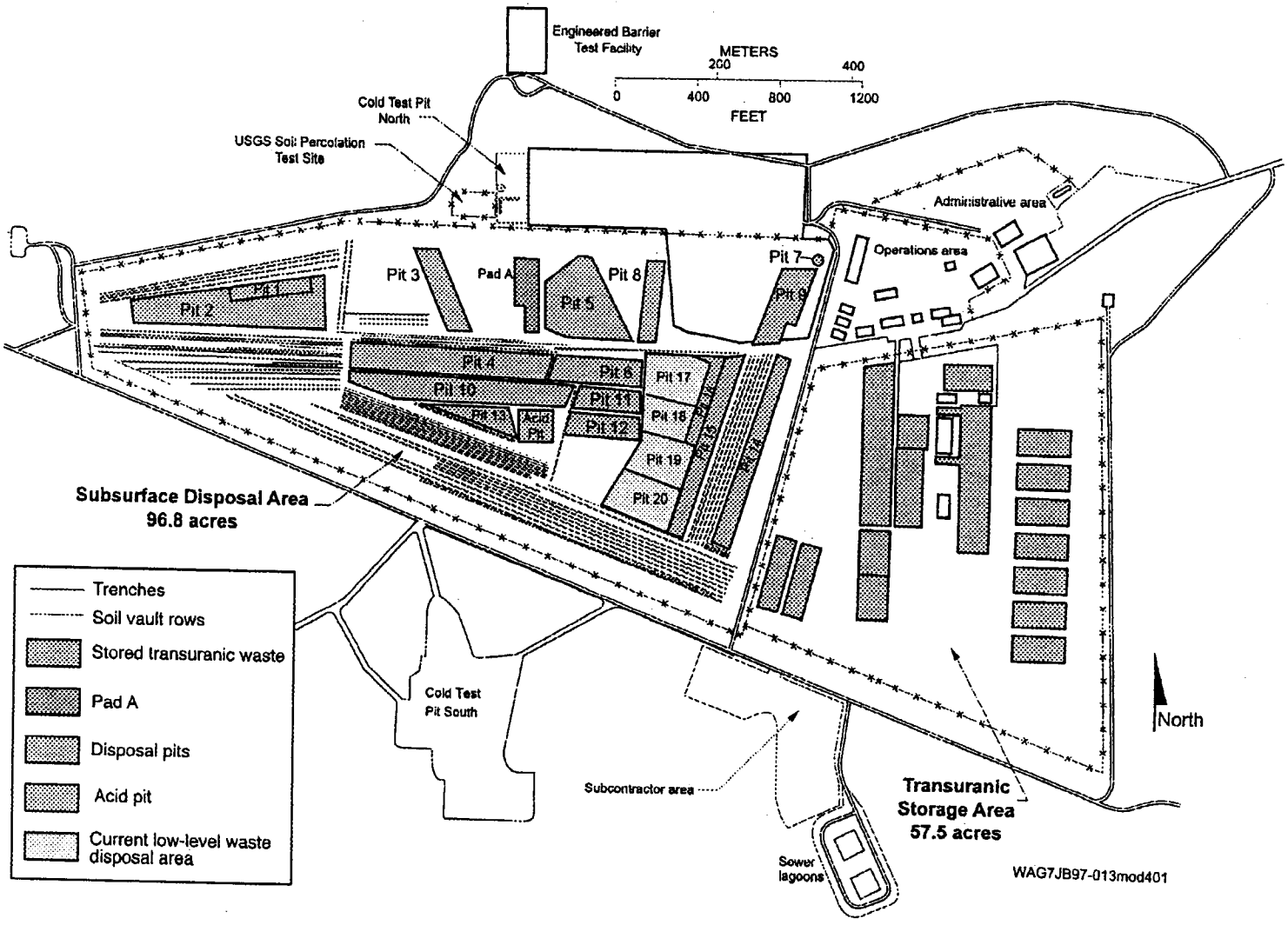


Attachment 1. Site Location Map: The Radioactive Waste Management Complex and major facilities at the Idaho National Engineering and Environmental Laboratory.



Attachment 2. Site Plan: Physical layout of the Radioactive Waste Management Complex.

Attachment 3. Uranium Lysimeter Data

Radio-nuclide	Location (Lysimeter ID)	Date Sample Collected	Result, sample (pCi/L)	Error (1s), sample result (pCi/L)	Unit, Sample Result	Val Flag	Soil Moisture Bkgd (pCi/L)(upper guideline). Based on lysimeters outside the SDA ("O" and D15 wells).	RBC= 10-5	Depth of lysimeter (ft)	Comments
U-233/ 234	D06-DL01	08/12/97	8.45	1.3	pCi/L		4.1	6.74	88	
U-233/ 234	D06-DL01	08/03/98	47.9	3.4	pCi/L		4.1	6.74	88	
U-233/ 234	D06-DL01	12/01/98	86.3	5.4	pCi/L		4.1	6.74	88	
U-233/ 234	D06-DL01	06/19/00	92.1	6.0	pCi/L		4.1	6.74	88	
U-233/ 234	D06-DL01	09/11/00	111	10	pCi/L		4.1	6.74	88	
U-233/ 234	D06-DL02	04/29/97	84.4	6.2	pCi/L		4.1	6.74	44	
U-233/ 234	D06-DL02	08/12/97	83.5	6.8	pCi/L		4.1	6.74	44	
U-233/ 234	D06-DL02	04/20/98	69.6	18.3	pCi/L		4.1	6.74	44	
U-233/ 234	D06-DL02	08/03/98	82.3	5.5	pCi/L		4.1	6.74	44	
U-233/ 234	D06-DL02	11/22/99	96.1	12.4	pCi/L		4.1	6.74	44	11/22/99 duplicates averaged for plots
U-233/ 234	D06-DL02	11/22/99	86.2	11.6	pCi/L		4.1	6.74	44	11/22/99 duplicates averaged for plots
U-233/ 234	D06-DL02	07/15/02	96.2	7.9	pCi/L		4.1	6.74	44	
U-233/ 234	PA01-L15	04/20/98	35.6	9.4	pCi/L		4.1	6.74	14.3	04/20/98 duplicates averaged for plots
U-233/ 234	PA01-L15	04/20/98	33.7	8.9	pCi/L		4.1	6.74	14.3	04/20/98 duplicates averaged for plots
U-233/ 234	PA01-L15	08/03/98	40.5	3.1	pCi/L	J	4.1	6.74	14.3	08/03/98 duplicates averaged for plots

Attachment 3. Uranium Lysimeter Data

U-233/ 234	PA01-L15	08/03/98	39.2	3.0	pCi/L		4.1	6.74	14.3	08/03/98 duplicates averaged for plots
U-233/ 234	PA01-L15	12/01/98	37.5	2.3	pCi/L		4.1	6.74	14.3	12/01/98 duplicates averaged for plots
U-233/ 234	PA01-L15	12/01/98	40.0	2.7	pCi/L		4.1	6.74	14.3	12/01/98 duplicates averaged for plots
U-233/ 234	PA01-L15	05/19/99	35.7	3.3	pCi/L		4.1	6.74	14.3	05/19/99 duplicates averaged for plots
U-233/ 234	PA01-L15	05/19/99	35.7	3.1	pCi/L		4.1	6.74	14.3	05/19/99 duplicates averaged for plots
U-233/ 234	PA01-L15	03/27/00	32.4	2.1	pCi/L		4.1	6.74	14.3	03/27/00 duplicates averaged for plots
U-233/ 234	PA01-L15	03/27/00	35.9	2.9	pCi/L		4.1	6.74	14.3	03/27/00 duplicates averaged for plots
U-233/ 234	PA01-L15	06/19/00	31.5	2.2	pCi/L		4.1	6.74	14.3	06/19/00 duplicates averaged for plots
U-233/ 234	PA01-L15	06/19/00	41.9	3.9	pCi/L		4.1	6.74	14.3	06/19/00 duplicates averaged for plots
U-233/ 234	PA01-L15	06/19/00	39.2	2.8	pCi/L		4.1	6.74	14.3	06/19/00 duplicates averaged for plots
U-233/ 234	PA01-L15	06/19/00	37.7	3.5	pCi/L		4.1	6.74	14.3	06/19/00 duplicates averaged for plots
U-233/ 234	PA01-L15	09/11/00	24.6	2.9	pCi/L		4.1	6.74	14.3	09/11/00 duplicates averaged for plots
U-233/ 234	PA01-L15	09/11/00	34.1	3.3	pCi/L		4.1	6.74	14.3	09/11/00 duplicates averaged for plots
U-233/ 234	PA01-L15	09/11/00	34.7	3.2	pCi/L		4.1	6.74	14.3	09/11/00 duplicates averaged for plots

Attachment 3. Uranium Lysimeter Data

U-233/234	PA01-L15	09/11/00	40.3	4.0	pCi/L		4.1	6.74	14.3	09/11/00 duplicates averaged for plots
U-233/234	PA01-L15	09/11/00	30.9	3.5	pCi/L		4.1	6.74	14.3	09/11/00 duplicates averaged for plots
U-233/234	PA01-L15	05/15/01	11.0	1.9	pCi/L		4.1	6.74	14.3	
U-233/234	PA01-L15	04/25/02	25.2	2.5	pCi/L		4.1	6.74	14.3	
U-233/234	PA01-L15	07/16/02	36.8	3.4	pCi/L		4.1	6.74	14.3	
U-233/234	PA02-L16	04/20/98	24.9	6.6	pCi/L		4.1	6.74	8.7	
U-233/234	PA02-L16	08/03/98	27.8	2.3	pCi/L		4.1	6.74	8.7	08/03/98 duplicates averaged for plots
U-233/234	PA02-L16	08/03/98	29.4	2.4	pCi/L		4.1	6.74	8.7	08/03/98 duplicates averaged for plots
U-233/234	PA02-L16	12/01/98	29.6	1.9	pCi/L		4.1	6.74	8.7	12/01/98 duplicates averaged for plots
U-233/234	PA02-L16	12/01/98	32.8	2.2	pCi/L		4.1	6.74	8.7	12/01/98 duplicates averaged for plots
U-233/234	PA02-L16	05/19/99	29.4	2.7	pCi/L		4.1	6.74	8.7	05/19/99 duplicates averaged for plots
U-233/234	PA02-L16	05/19/99	29.2	2.6	pCi/L		4.1	6.74	8.7	05/19/99 duplicates averaged for plots
U-233/234	PA02-L16	03/27/00	26.1	1.9	pCi/L		4.1	6.74	8.7	03/27/00 duplicates averaged for plots
U-233/234	PA02-L16	03/27/00	26.4	2.5	pCi/L		4.1	6.74	8.7	03/27/00 duplicates averaged for plots
U-233/234	PA02-L16	06/19/00	26.2	2.0	pCi/L		4.1	6.74	8.7	06/19/00 duplicates averaged for plots

Attachment 3. Uranium Lysimeter Data

U-233/234	PA02-L16	06/19/00	27.5	2.0	pCi/L		4.1	6.74	8.7	06/19/00 duplicates averaged for plots
U-233/234	PA02-L16	06/19/00	26.0	2.6	pCi/L		4.1	6.74	8.7	06/19/00 duplicates averaged for plots
U-233/234	PA02-L16	09/11/00	29.9	3.6	pCi/L		4.1	6.74	8.7	
U-233/234	PA02-L16	12/04/00	24.3	3.4	pCi/L		4.1	6.74	8.7	
U-233/234	PA02-L16	05/15/01	5.20	0.89	pCi/L		4.1	6.74	8.7	
U-233/234	PA03-L33	04/29/97	43.2	3.3	pCi/L		4.1	6.74	10.0	
U-233/234	PA03-L33	08/12/97	35.4	3.0	pCi/L		4.1	6.74	10.0	
U-233/234	PA03-L33	02/24/98	54.5	4.6	pCi/L		4.1	6.74	10.0	
U-233/234	PA03-L33	04/20/98	45.6	12.0	pCi/L		4.1	6.74	10.0	
U-233/234	PA03-L33	12/01/98	56.5	3.6	pCi/L		4.1	6.74	10.0	
U-233/234	PA03-L33	05/19/99	53.4	7.2	pCi/L		4.1	6.74	10.0	05/19/99 duplicates averaged for plots
U-233/234	PA03-L33	05/19/99	52.8	7.3	pCi/L		4.1	6.74	10.0	05/19/99 duplicates averaged for plots
U-233/234	PA03-L33	11/22/99	57.9	7.7	pCi/L		4.1	6.74	10.0	11/22/99 duplicates averaged for plots
U-233/234	PA03-L33	11/22/99	53.9	7.5	pCi/L		4.1	6.74	10.0	11/22/99 duplicates averaged for plots
U-233/234	PA03-L33	03/27/00	61.9	4.0	pCi/L		4.1	6.74	10.0	
U-233/234	TW1-DL04	02/24/98	90.0	7.3	pCi/L		4.1	6.74	101.7	
U-233/234	TW1-DL04	04/20/98	82.8	21.7	pCi/L		4.1	6.74	101.7	
U-233/234	TW1-DL04	08/04/98	97.4	6.5	pCi/L		4.1	6.74	101.7	

Attachment 3. Uranium Lysimeter Data

U-233/234	TW1-DL04	11/30/98	96.7	5.8	pCi/L		4.1	6.74	101.7	
U-233/234	TW1-DL04	03/03/99	90.2	13.8	pCi/L		4.1	6.74	101.7	03/03/99 duplicates averaged for plots
U-233/234	TW1-DL04	03/03/99	86.1	10.3	pCi/L		4.1	6.74	101.7	03/03/99 duplicates averaged for plots
U-233/234	TW1-DL04	11/22/99	93.7	12.2	pCi/L		4.1	6.74	101.7	
U-233/234	TW1-DL04	03/27/00	90.6	6.2	pCi/L		4.1	6.74	101.7	
U-233/234	TW1-DL04	06/19/00	92.9	6.1	pCi/L		4.1	6.74	101.7	06/19/00 duplicates averaged for plots
U-233/234	TW1-DL04	06/19/00	86.7	7.6	pCi/L		4.1	6.74	101.7	06/19/00 duplicates averaged for plots
U-233/234	TW1-DL04	09/11/00	87.0	8.4	pCi/L		4.1	6.74	101.7	
U-233/234	TW1-DL04	05/15/01	5.15	1.05	pCi/L		4.1	6.74	101.7	
U-233/234	TW1-DL04	10/22/02	57.3	5.0	pCi/L		4.1	6.74	101.7	
U-235/236	D06-DL01	08/12/97	0.76	0.35	pCi/L	UJ	0.7	6.63	88	
U-235/236	D06-DL01	08/03/98	1.74	0.39	pCi/L		0.7	6.63	88	
U-235/236	D06-DL01	12/01/98	2.84	0.43	pCi/L		0.7	6.63	88	
U-235/236	D06-DL01	06/19/00	3.26	0.47	pCi/L		0.7	6.63	88	
U-235/236	D06-DL01	09/11/00	2.90	0.62	pCi/L		0.7	6.63	88	
U-235/236	D06-DL02	04/29/97	2.24	0.35	pCi/L		0.7	6.63	44	
U-235/236	D06-DL02	08/12/97	2.93	0.59	pCi/L		0.7	6.63	44	
U-235/236	D06-DL02	04/20/98	2.35	0.73	pCi/L		0.7	6.63	44	
U-235/236	D06-DL02	08/03/98	2.46	0.51	pCi/L		0.7	6.63	44	

Attachment 3. Uranium Lysimeter Data

U-235/ 236	D06-DL02	11/22/99	2.28	0.83	pCi/L	J	0.7	6.63	44	11/22/99 duplicates averaged for plots
U-235/ 236	D06-DL02	11/22/99	3.21	0.82	pCi/L		0.7	6.63	44	11/22/99 duplicates averaged for plots
U-235/ 236	D06-DL02	07/15/02	3.66	0.65	pCi/L		0.7	6.63	44	
U-235/ 236	PA01-L15	04/20/98	1.18	0.45	pCi/L	J	0.7	6.63	14.3	04/20/98 duplicates averaged for plots
U-235/ 236	PA01-L15	04/20/98	1.04	0.38	pCi/L	J	0.7	6.63	14.3	04/20/98 duplicates averaged for plots
U-235/ 236	PA01-L15	08/03/98	2.33	0.53	pCi/L	J	0.7	6.63	14.3	08/03/98 duplicates averaged for plots
U-235/ 236	PA01-L15	08/03/98	1.07	0.35	pCi/L		0.7	6.63	14.3	08/03/98 duplicates averaged for plots
U-235/ 236	PA01-L15	12/01/98	1.21	0.17	pCi/L		0.7	6.63	14.3	12/01/98 duplicates averaged for plots
U-235/ 236	PA01-L15	12/01/98	1.56	0.31	pCi/L		0.7	6.63	14.3	12/01/98 duplicates averaged for plots
U-235/ 236	PA01-L15	05/19/99	1.23	0.32	pCi/L		0.7	6.63	14.3	05/19/99 duplicates averaged for plots
U-235/ 236	PA01-L15	05/19/99	0.99	0.23	pCi/L		0.7	6.63	14.3	05/19/99 duplicates averaged for plots
U-235/ 236	PA01-L15	03/27/00	1.37	0.19	pCi/L	J	0.7	6.63	14.3	03/27/00 duplicates averaged for plots
U-235/ 236	PA01-L15	03/27/00	1.48	0.33	pCi/L	J	0.7	6.63	14.3	03/27/00 duplicates averaged for plots
U-235/ 236	PA01-L15	06/19/00	0.00	0.00	pCi/L	UJ	0.7	6.63	14.3	06/19/00 duplicates averaged for plots

Attachment 3. Uranium Lysimeter Data

U-235/ 236	PA01-L15	06/19/00	0.00	0.55	pCi/L	UJ	0.7	6.63	14.3	06/19/00 duplicates averaged for plots
U-235/ 236	PA01-L15	06/19/00	1.73	0.31	pCi/L		0.7	6.63	14.3	06/19/00 duplicates averaged for plots
U-235/ 236	PA01-L15	06/19/00	1.74	0.35	pCi/L		0.7	6.63	14.3	06/19/00 duplicates averaged for plots
U-235/ 236	PA01-L15	09/11/00	0.72	0.86	pCi/L	U	0.7	6.63	14.3	09/11/00 duplicates averaged for plots
U-235/ 236	PA01-L15	09/11/00	0.69	0.25	pCi/L	UJ	0.7	6.63	14.3	09/11/00 duplicates averaged for plots
U-235/ 236	PA01-L15	09/11/00	1.07	0.34	pCi/L		0.7	6.63	14.3	09/11/00 duplicates averaged for plots
U-235/ 236	PA01-L15	09/11/00	1.34	0.37	pCi/L		0.7	6.63	14.3	09/11/00 duplicates averaged for plots
U-235/ 236	PA01-L15	05/15/01	0.16	0.29	pCi/L	U	0.7	6.63	14.3	
U-235/ 236	PA01-L15	04/25/02	0.76	0.31	pCi/L	J	0.7	6.63	14.3	
U-235/ 236	PA01-L15	07/16/02	3.25	0.63	pCi/L		0.7	6.63	14.3	
U-235/ 236	PA01-L15	09/11/00	1.48	0.52	pCi/L	J	0.7	6.63	14.3	09/11/00 duplicates averaged for plots
U-235/ 236	PA02-L16	04/20/98	1.06	0.40	pCi/L	J	0.7	6.63	8.7	
U-235/ 236	PA02-L16	08/03/98	0.97	0.37	pCi/L	UJ	0.7	6.63	8.7	08/03/98 duplicates averaged for plots
U-235/ 236	PA02-L16	08/03/98	2.33	0.48	pCi/L		0.7	6.63	8.7	08/03/98 duplicates averaged for plots
U-235/ 236	PA02-L16	12/01/98	1.05	0.16	pCi/L		0.7	6.63	8.7	12/01/98 duplicates averaged for plots

Attachment 3. Uranium Lysimeter Data

U-235/ 236	PA02-L16	12/01/98	0.58	0.16	pCi/L		0.7	6.63	8.7	12/01/98 duplicates averaged for plots
U-235/ 236	PA02-L16	05/19/99	0.67	0.24	pCi/L	J	0.7	6.63	8.7	05/19/99 duplicates averaged for plots
U-235/ 236	PA02-L16	05/19/99	0.31	0.21	pCi/L	U	0.7	6.63	8.7	05/19/99 duplicates averaged for plots
U-235/ 236	PA02-L16	03/27/00	1.21	0.23	pCi/L	J	0.7	6.63	8.7	03/27/00 duplicates averaged for plots
U-235/ 236	PA02-L16	03/27/00	0.92	0.34	pCi/L	J	0.7	6.63	8.7	03/27/00 duplicates averaged for plots
U-235/ 236	PA02-L16	06/19/00	1.22	0.46	pCi/L	UJ	0.7	6.63	8.7	06/19/00 duplicates averaged for plots
U-235/ 236	PA02-L16	06/19/00	2.08	0.39	pCi/L		0.7	6.63	8.7	06/19/00 duplicates averaged for plots
U-235/ 236	PA02-L16	06/19/00	1.50	0.30	pCi/L		0.7	6.63	8.7	06/19/00 duplicates averaged for plots
U-235/ 236	PA02-L16	09/11/00	1.06	0.48	pCi/L	UJ	0.7	6.63	8.7	
U-235/ 236	PA02-L16	12/04/00	0.25	0.21	pCi/L	U	0.7	6.63	8.7	
U-235/ 236	PA02-L16	05/15/01	0.38	0.24	pCi/L	U	0.7	6.63	8.7	
U-235/ 236	PA03-L33	04/29/97	1.79	0.31	pCi/L		0.7	6.63	10.0	
U-235/ 236	PA03-L33	08/12/97	1.61	0.38	pCi/L		0.7	6.63	10.0	
U-235/ 236	PA03-L33	02/24/98	2.62	0.49	pCi/L		0.7	6.63	10.0	
U-235/ 236	PA03-L33	04/20/98	1.88	0.62	pCi/L		0.7	6.63	10.0	
U-235/ 236	PA03-L33	12/01/98	2.30	0.34	pCi/L		0.7	6.63	10.0	
U-235/ 236	PA03-L33	05/19/99	1.23	0.53	pCi/L	UJ	0.7	6.63	10.0	05/19/99 duplicates averaged for plots

Attachment 3. Uranium Lysimeter Data

U-235/ 236	PA03-L33	05/19/99	1.38	0.62	pCi/L	UJ	0.7	6.63	10.0	05/19/99 duplicates averaged for plots
U-235/ 236	PA03-L33	11/22/99	1.36	0.61	pCi/L	J	0.7	6.63	10.0	11/22/99 duplicates averaged for plots
U-235/ 236	PA03-L33	11/22/99	3.52	0.86	pCi/L		0.7	6.63	10.0	11/22/99 duplicates averaged for plots
U-235/ 236	PA03-L33	03/27/00	2.95	0.36	pCi/L	J	0.7	6.63	10.0	
U-235/ 236	TW1-DL04	02/24/98	4.12	0.6	pCi/L		0.7	6.63	101.7	
U-235/ 236	TW1-DL04	04/20/98	2.94	0.9	pCi/L		0.7	6.63	101.7	
U-235/ 236	TW1-DL04	08/04/98	4.69	0.8	pCi/L		0.7	6.63	101.7	
U-235/ 236	TW1-DL04	11/30/98	4.3	0.4	pCi/L		0.7	6.63	101.7	
U-235/ 236	TW1-DL04	03/03/99	4.3	1.1	pCi/L		0.7	6.63	101.7	03/03/99 duplicates averaged for plots
U-235/ 236	TW1-DL04	03/03/99	4.10	0.7	pCi/L		0.7	6.63	101.7	03/03/99 duplicates averaged for plots
U-235/ 236	TW1-DL04	11/22/99	5.72	1.2	pCi/L		0.7	6.63	101.7	
U-235/ 236	TW1-DL04	03/27/00	4.06	0.6	pCi/L	J	0.7	6.63	101.7	
U-235/ 236	TW1-DL04	06/19/00	4.73	0.6	pCi/L		0.7	6.63	101.7	06/19/00 duplicates averaged for plots
U-235/ 236	TW1-DL04	06/19/00	8.22	1.6	pCi/L		0.7	6.63	101.7	06/19/00 duplicates averaged for plots
U-235/ 236	TW1-DL04	09/11/00	4.27	1.0	pCi/L		0.7	6.63	101.7	
U-235/ 236	TW1-DL04	05/15/01	0.72	0.33	pCi/L	J	0.7	6.63	101.7	
U-235/ 236	TW1-DL04	10/22/02	1.83	0.46	pCi/L		0.7	6.63	101.7	
U-238	D06-DL01	08/12/97	7.20	1.2	pCi/L		2.1	5.47	88	
U-238	D06-DL01	08/03/98	28.4	2.3	pCi/L		2.1	5.47	88	

Attachment 3. Uranium Lysimeter Data

U-238	D06-DL01	12/01/98	48.6	3.2	pCi/L		2.1	5.47	88	
U-238	D06-DL01	06/19/00	41.4	2.9	pCi/L		2.1	5.47	88	
U-238	D06-DL01	09/11/00	52.6	4.8	pCi/L		2.1	5.47	88	
U-238	D06-DL02	04/29/97	49.4	3.8	pCi/L		2.1	5.47	44	
U-238	D06-DL02	08/12/97	41.9	3.7	pCi/L		2.1	5.47	44	
U-238	D06-DL02	04/20/98	42.1	11.1	pCi/L		2.1	5.47	44	
U-238	D06-DL02	08/03/98	48.9	3.6	pCi/L		2.1	5.47	44	
U-238	D06-DL02	11/22/99	47.2	6.4	pCi/L		2.1	5.47	44	11/22/99 duplicates averaged for plots
U-238	D06-DL02	11/22/99	42.8	6.2	pCi/L		2.1	5.47	44	11/22/99 duplicates averaged for plots
U-238	D06-DL02	07/15/02	42.0	3.7	pCi/L		2.1	5.47	44	
U-238	PA01-L15	04/20/98	19.9	5.3	pCi/L		2.1	5.47	14.3	04/20/98 duplicates averaged for plots
U-238	PA01-L15	04/20/98	19.9	5.3	pCi/L		2.1	5.47	14.3	04/20/98 duplicates averaged for plots
U-238	PA01-L15	08/03/98	20.9	1.9	pCi/L		2.1	5.47	14.3	08/03/98 duplicates averaged for plots
U-238	PA01-L15	08/03/98	21.1	1.9	pCi/L		2.1	5.47	14.3	08/03/98 duplicates averaged for plots
U-238	PA01-L15	12/01/98	21.5	1.4	pCi/L		2.1	5.47	14.3	12/01/98 duplicates averaged for plots
U-238	PA01-L15	12/01/98	24.2	1.8	pCi/L		2.1	5.47	14.3	12/01/98 duplicates averaged for plots
U-238	PA01-L15	05/19/99	21.0	2.1	pCi/L		2.1	5.47	14.3	05/19/99 duplicates averaged for plots
U-238	PA01-L15	05/19/99	20.4	1.9	pCi/L		2.1	5.47	14.3	05/19/99 duplicates averaged for plots
U-238	PA01-L15	03/27/00	19.1	1.3	pCi/L		2.1	5.47	14.3	03/27/00 duplicates averaged for plots

Attachment 3. Uranium Lysimeter Data

U-238	PA01-L15	03/27/00	18.8	1.7	pCi/L		2.1	5.47	14.3	03/27/00 duplicates averaged for plots
U-238	PA01-L15	06/19/00	19.0	1.5	pCi/L		2.1	5.47	14.3	06/19/00 duplicates averaged for plots
U-238	PA01-L15	06/19/00	26.3	2.7	pCi/L		2.1	5.47	14.3	06/19/00 duplicates averaged for plots
U-238	PA01-L15	06/19/00	23.8	1.8	pCi/L		2.1	5.47	14.3	06/19/00 duplicates averaged for plots
U-238	PA01-L15	06/19/00	21.5	2.3	pCi/L		2.1	5.47	14.3	06/19/00 duplicates averaged for plots
U-238	PA01-L15	09/11/00	15.6	2.0	pCi/L		2.1	5.47	14.3	09/11/00 duplicates averaged for plots
U-238	PA01-L15	09/11/00	21.3	2.2	pCi/L		2.1	5.47	14.3	09/11/00 duplicates averaged for plots
U-238	PA01-L15	09/11/00	17.2	1.8	pCi/L		2.1	5.47	14.3	09/11/00 duplicates averaged for plots
U-238	PA01-L15	09/11/00	24.0	2.6	pCi/L		2.1	5.47	14.3	09/11/00 duplicates averaged for plots
U-238	PA01-L15	09/11/00	16.9	2.2	pCi/L		2.1	5.47	14.3	09/11/00 duplicates averaged for plots
U-238	PA01-L15	05/15/01	7.05	1.4	pCi/L		2.1	5.47	14.3	
U-238	PA01-L15	04/25/02	13.2	1.6	pCi/L		2.1	5.47	14.3	
U-238	PA01-L15	07/16/02	20.2	2.1	pCi/L		2.1	5.47	14.3	
U-238	PA02-L16	04/20/98	13.2	3.6	pCi/L		2.1	5.47	8.7	
U-238	PA02-L16	08/03/98	13.9	1.4	pCi/L		2.1	5.47	8.7	08/03/98 duplicates averaged for plots
U-238	PA02-L16	08/03/98	12.7	1.4	pCi/L		2.1	5.47	8.7	08/03/98 duplicates averaged for plots

Attachment 3. Uranium Lysimeter Data

U-238	PA02-L16	12/01/98	15.3	1.0	pCi/L		2.1	5.47	8.7	12/01/98 duplicates averaged for plots
U-238	PA02-L16	12/01/98	16.1	1.2	pCi/L		2.1	5.47	8.7	12/01/98 duplicates averaged for plots
U-238	PA02-L16	05/19/99	16.1	1.5	pCi/L		2.1	5.47	8.7	05/19/99 duplicates averaged for plots
U-238	PA02-L16	05/19/99	13.4	1.4	pCi/L		2.1	5.47	8.7	05/19/99 duplicates averaged for plots
U-238	PA02-L16	03/27/00	13.3	1.1	pCi/L		2.1	5.47	8.7	03/27/00 duplicates averaged for plots
U-238	PA02-L16	03/27/00	12.7	1.5	pCi/L		2.1	5.47	8.7	03/27/00 duplicates averaged for plots
U-238	PA02-L16	06/19/00	14.3	1.2	pCi/L		2.1	5.47	8.7	06/19/00 duplicates averaged for plots
U-238	PA02-L16	06/19/00	11.7	1.0	pCi/L		2.1	5.47	8.7	06/19/00 duplicates averaged for plots
U-238	PA02-L16	06/19/00	13.7	1.6	pCi/L		2.1	5.47	8.7	06/19/00 duplicates averaged for plots
U-238	PA02-L16	09/11/00	14.5	2.1	pCi/L		2.1	5.47	8.7	
U-238	PA02-L16	12/04/00	13.9	2.1	pCi/L		2.1	5.47	8.7	
U-238	PA02-L16	05/15/01	3.59	0.7	pCi/L		2.1	5.47	8.7	
U-238	PA03-L33	04/29/97	34.2	2.7	pCi/L		2.1	5.47	10.0	
U-238	PA03-L33	08/12/97	25.7	2.3	pCi/L		2.1	5.47	10.0	
U-238	PA03-L33	02/24/98	39.5	3.4	pCi/L		2.1	5.47	10.0	
U-238	PA03-L33	04/20/98	33.4	8.9	pCi/L		2.1	5.47	10.0	
U-238	PA03-L33	12/01/98	41.2	2.7	pCi/L		2.1	5.47	10.0	
U-238	PA03-L33	05/19/99	38.5	5.4	pCi/L		2.1	5.47	10.0	05/19/99 duplicates averaged for plots
U-238	PA03-L33	05/19/99	35.6	5.1	pCi/L		2.1	5.47	10.0	05/19/99 duplicates averaged for plots

Attachment 3. Uranium Lysimeter Data

U-238	PA03-L33	11/22/99	41.5	5.7	pCi/L		2.1	5.47	10.0	11/22/99 duplicates averaged for plots
U-238	PA03-L33	11/22/99	35.3	5.1	pCi/L		2.1	5.47	10.0	11/22/99 duplicates averaged for plots
U-238	PA03-L33	03/27/00	44.0	3.0	pCi/L		2.1	5.47	10.0	
U-238	TW1-DL04	02/24/98	9.8	1.1	pCi/L		2.1	5.47	101.7	
U-238	TW1-DL04	04/20/98	8.15	2.2	pCi/L		2.1	5.47	101.7	
U-238	TW1-DL04	08/04/98	9.48	1.1	pCi/L		2.1	5.47	101.7	
U-238	TW1-DL04	11/30/98	9.64	0.9	pCi/L		2.1	5.47	101.7	
U-238	TW1-DL04	03/03/99	9.06	1.5	pCi/L		2.1	5.47	101.7	03/03/99 duplicates averaged for plots
U-238	TW1-DL04	03/03/99	7.4	1.4	pCi/L		2.1	5.47	101.7	03/03/99 duplicates averaged for plots
U-238	TW1-DL04	11/22/99	9.60	1.8	pCi/L		2.1	5.47	101.7	
U-238	TW1-DL04	03/27/00	9.61	1.0	pCi/L		2.1	5.47	101.7	
U-238	TW1-DL04	06/19/00	9.07	0.9	pCi/L		2.1	5.47	101.7	06/19/00 duplicates averaged for plots
U-238	TW1-DL04	06/19/00	8.0	1.6	pCi/L		2.1	5.47	101.7	06/19/00 duplicates averaged for plots
U-238	TW1-DL04	09/11/00	8.89	1.5	pCi/L		2.1	5.47	101.7	
U-238	TW1-DL04	05/15/01	2.57	0.7	pCi/L		2.1	5.47	101.7	
U-238	TW1-DL04	10/22/02	5.09	0.80	pCi/L		2.1	5.47	101.7	

Attachment 4: Nitrate Lysimeter Data

Compound	Location, Lysimeter ID	Date Sample Collected	Result, sample	Error, Sample (rad only)	Unit, Sample Result	Lab Qualifier Flag	Val Flag	Soil Moisture Bkgd (upper guideline) (mg/L)	Depth of lysimeter (ft)	Comments
Nitrate-N	D06-DL01	04/03/96	129		mg/l			3.2	88	Possible NO3 acid preservative mistakenly added to sample.
Nitrate-N	D06-DL01	08/12/97	17.2		mg/l			3.2	88	
Nitrate-N	D06-DL01	04/20/98	9.03		mg/l		J	3.2	88	
Nitrate-N	D06-DL02	04/18/95	32.2		mg/L			3.2	44	
Nitrate-N	D06-DL02	08/12/97	24.0		mg/l			3.2	44	
Nitrate-N	D06-DL02	04/20/98	23.7		mg/l		J	3.2	44	
Nitrate-N	D06-DL02	03/27/00	14.0		mg/l			3.2	44	
Nitrate-N	D06-DL02	07/15/02	12.5		mg/L		J	3.2	44	
Nitrate-N	PA01-L15	05/11/95	6.82		mg/L			3.2	14.3	
Nitrate-N	PA01-L15	09/27/95	20.8		mg/L			3.2	14.3	
Nitrate-N	PA01-L15	04/16/96	16.9		mg/L			3.2	14.3	
Nitrate-N	PA01-L15	04/29/97	5.65		mg/L			3.2	14.3	
Nitrate-N	PA01-L15	08/12/97	4.02		mg/L			3.2	14.3	
Nitrate-N	PA01-L15	08/12/97	6.38		mg/L			3.2	14.3	
Nitrate-N	PA01-L15	08/15/97	33.0		mg/L			3.2	14.3	
Nitrate-N	PA01-L15	04/20/98	5.89		mg/L		J	3.2	14.3	
Nitrate-N	PA01-L15	08/03/98	26.3		mg/L		J	3.2	14.3	
Nitrate-N	PA01-L15	12/01/98	29.9		mg/L		J	3.2	14.3	
Nitrate-N	PA01-L15	03/27/00	8.10		mg/L			3.2	14.3	
Nitrate-N	PA01-L15	06/19/00	43.1		mg/L			3.2	14.3	
Nitrate-N	PA01-L15	06/19/00	9.94		mg/L			3.2	14.3	
Nitrate-N	PA01-L15	05/15/01	8.70		mg/L		J	3.2	14.3	
Nitrate-N	PA01-L15	07/16/02	12.9		mg/L			3.2	14.3	
Nitrate-N	PA02-L16	04/18/95	42.8		mg/L			3.2	8.7	
Nitrate-N	PA02-L16	09/27/95	232		mg/L			3.2	8.7	Possible NO3 acid preservative mistakenly added to sample.
Nitrate-N	PA02-L16	04/16/96	242		mg/L			3.2	8.7	Possible NO3 acid preservative mistakenly added to sample.
Nitrate-N	PA02-L16	09/25/96	0.98		mg/l			3.2	8.7	
Nitrate-N	PA02-L16	04/29/97	48.5		mg/L			3.2	8.7	
Nitrate-N	PA02-L16	08/12/97	44.8		mg/L			3.2	8.7	
Nitrate-N	PA02-L16	08/12/97	47.3		mg/L			3.2	8.7	

Attachment 4: Nitrate Lysimeter Data

Nitrate-N	PA02-L16	08/15/97	202		mg/L			3.2	8.7	Possible NO3 acid preservative mistakenly added to sample.
Nitrate-N	PA02-L16	02/24/98	55.6		mg/L		J	3.2	8.7	
Nitrate-N	PA02-L16	04/20/98	45.9		mg/L			3.2	8.7	
Nitrate-N	PA02-L16	08/03/98	205		mg/L		J	3.2	8.7	Possible NO3 acid preservative mistakenly added to sample.
Nitrate-N	PA02-L16	12/01/98	232		mg/L		J	3.2	8.7	Possible NO3 acid preservative mistakenly added to sample.
Nitrate-N	PA02-L16	03/27/00	47.0		mg/L			3.2	8.7	
Nitrate-N	PA02-L16	05/15/01	30.3		mg/L		J	3.2	8.7	
Nitrate-N	PA03-L33	05/11/95	8.34		mg/L			3.2	10.0	
Nitrate-N	PA03-L33	04/16/96	37.8		mg/L			3.2	10.0	
Nitrate-N	PA03-L33	08/12/97	8.93		mg/L			3.2	10.0	
Nitrate-N	PA03-L33	02/24/98	10.6		mg/L		J	3.2	10.0	
Nitrate-N	PA03-L33	04/20/98	10.0		mg/L		J	3.2	10.0	
Nitrate-N	PA03-L33	03/27/00	8.00		mg/L			3.2	10.0	
Nitrate-N	TW1-DL04	04/18/95	2.00		mg/L			3.2	101.7	
Nitrate-N	TW1-DL04	04/18/95	2.71		mg/L			3.2	101.7	
Nitrate-N	TW1-DL04	09/24/96	0.71		mg/l			3.2	101.7	
Nitrate-N	TW1-DL04	02/24/98	13.1		mg/l		J	3.2	101.7	
Nitrate-N	TW1-DL04	04/20/98	14.2		mg/l		J	3.2	101.7	
Nitrate-N	TW1-DL04	03/27/00	13.0		mg/l			3.2	101.7	
Nitrate-N	TW1-DL04	05/15/01	7.75		mg/L		J	3.2	101.7	
Nitrate-N	TW1-DL04	07/16/02	10.9		mg/L			3.2	101.7	

ATTACHMENT 5

List of Documents Reviewed

Record of Decision. Declaration for Pad A at the Radioactive Waste Management Complex Subsurface Disposal Area at the Idaho National Engineering Laboratory Idaho falls, Idaho, January 1994

Remedial Design/Remedial Action Scope of Work, Pad A Limited Action, Radioactive Waste Management Complex, Operable Unit 7-12, May 9, 1994.

Remedial Design/Remedial Action (RD/RA) Work Plan, Pad A Limited Action, Radioactive Waste Management Complex, Operable Unit 7-12, June 1994.

Remedial Action Report, Pad A Limited Action, Operable Unit 7-12, July, 1995.

Pad A Two Year Review and Closeout Package, October 14, 1997.

Transmittal of the OU 7-12 Pad A Monthly Inspection Reports for FY 2002 (EM-ER-02-163), September 26, 2002.

Transmittal of the Pad A 2002 Subsidence Topographical Survey Report (EM-ER-02-097), June 4, 2002.

Transmittal of the Evaluation of Revegetation Efforts on Pad A (EM-ER-192-00), October 2, 2000.

Transmittal of the Pad A Operations, Maintenance and Monitoring Plan (EM-ER-01-093), May 30, 2001.

Ancillary Basis for Risk Analysis of the Subsurface Disposal Area, INEEL/EXT-02-01125, September 2002.

Limitations and Validation Reports for Lysimeter and Perched Water Sampling Conducted In October 2002 for Waste Area Group 7 (EM-ER-03-053), February 20, 2003.

nspection at Pad A and recommendations. Ted Liberates (IDEQ) to Mark Shaw (DOE), September 24, 2002.

FY 2002 Environmental Monitoring Report for the Radioactive Waste Management Complex, INEEL/EXT-03-00055, March 2003

ATTACHMENT 6

Applicable or Relevant and Appropriate Requirements (ARARs)

Medium/ Authority	ARAR	Status	Requirement Synopsis	Action to be taken to Attain ARAR
Soil/ HMWA	Landfill closure IDAPA 16.01.05008 (40 CFR 264.310)	Relevant	Closure and post-closure care.	Cover maintenance and institutional controls.
Air/IDAPA	IDAPA 16.01.01.01251 and 16.01.01.01252.	Applicable	Control of fugitive dust	Cover maintenance and institutional controls.
Soil/RCRA	OSWER 9234.2-04FS, October 1989.	TBC	Focus on closure requirements	Cover maintenance and institutional controls.
Soil/RCRA	OSWER 9476.00-1, September 1982.	TBC	Evaluating cover systems for solid and hazardous wastes.	Cover maintenance and institutional controls.
Soil/DOE	DOE 5820.2A	TBC	Radioactive waste management.	Cover maintenance and institutional controls.
Soil/DOE	DOE 5400.5	TBC	Radiation protection of the public and the environment.	Cover maintenance and institutional controls.